

**ABSTRACT OF THE DISCLOSURE**

Disclosed are novel nucleic acid and peptide compositions comprising methylthioadenosine phosphorylase (MTAP) and methods of use for MTAP amino acid sequences and DNA segments comprising *MTAP* in the diagnosis of human cancers and development of MTAP-specific antibodies. Also disclosed are methods for the diagnosis and treatment of tumors and other proliferative cell disorders, and identification of tumor suppressor genes and gene products from the human 9p21-p22 chromosome region. Such methods are useful in the diagnosis of multiple tumor types such as bladder cancer, lung cancer, breast cancer, pancreatic cancer, brain tumors, lymphomas, gliomas, melanomas, and leukemias.